

ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check

**6-6-4. Aft Short Shaft Assembly -Removal/Installation**

Removal and Installation (On Helicopter)

**INITIAL SETUP**

**Applicable Configurations:**

All

**Tools:**

General Mechanic Tool Kit (B-190)

Maintenance Stand (B-173)

**Personnel Required:**

15S Scout Helicopter Technical Inspector (TI)

15S Scout Helicopter Repairer

Pilot

**References:**

TM 1-1520-248-10 TM 1-1520-248-CL

**Equipment Condition:**

Helicopter Safed (Task 1-6-7)

Aft Fairing Assembly Removed (Task 2-2-55)

Aft Fairing Extension Removed (Task 2-2-56)

AN/ALQ-144 IR Jammer Mount Removed (Task 2-3-13)

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REMOVE

1. Gain access to aft short shaft assembly (1) by opening tail rotor driveshaft cover.

**Warning**

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

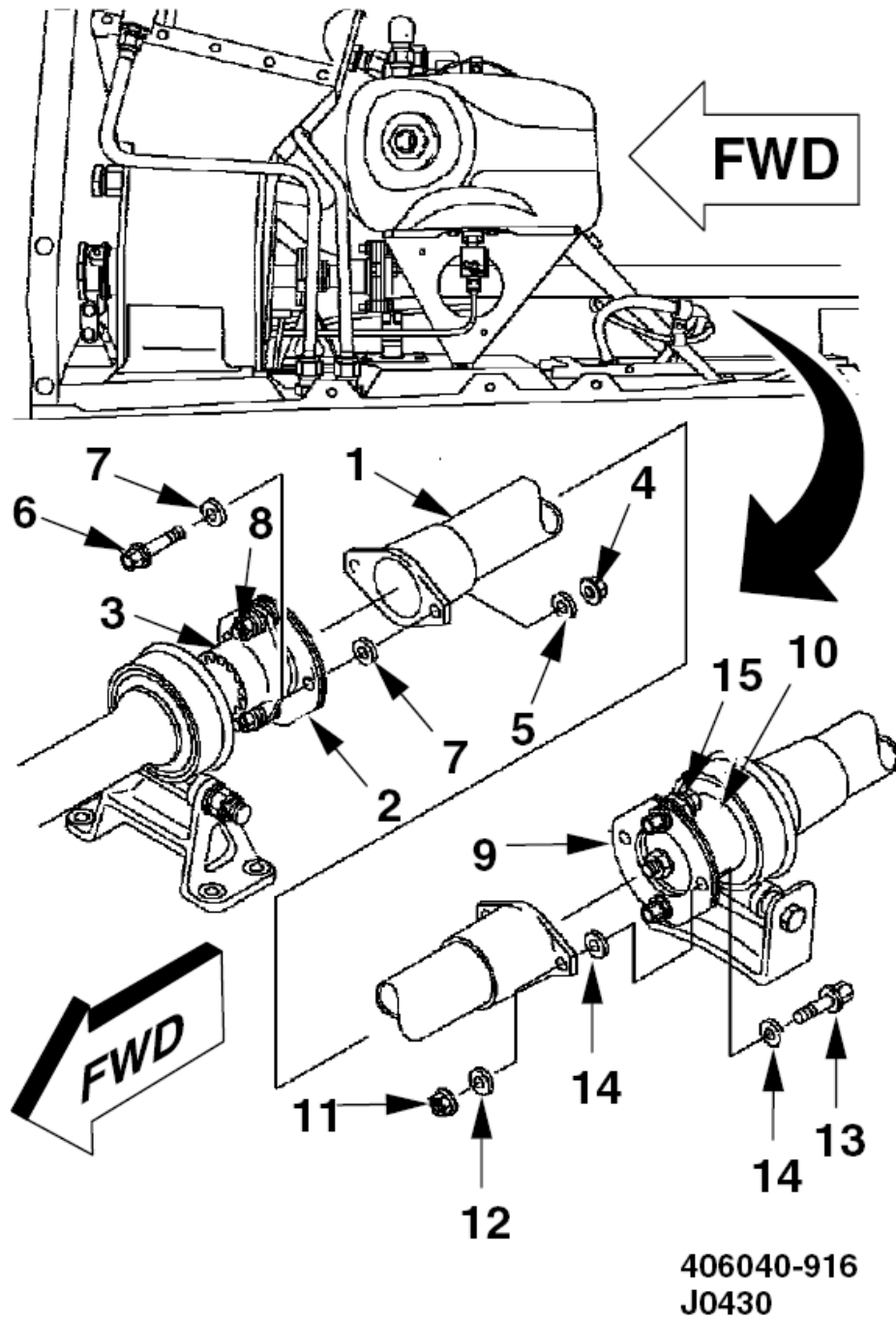
Surface condition of the aft short shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during removal or handling. Extreme caution shall be used during removal and handling.

**Caution**

Aft short shaft assembly shall be supported to prevent damage to coupling disc packs.

2. Break torque on eight nuts (4), (8), (11), and (15).
3. Disconnect forward end of aft short shaft assembly (1) from coupling disc pack (2) on adapter (3) by removing two nuts (4), two flat washers (5), two bolts (6), and four beveled washers (7).
4. Disconnect aft end of aft short shaft assembly (1) from coupling disc pack (9) on driveshaft assembly (10) by removing two nuts (11), two flat washers (12), two bolts (13), and four beveled washers (14).
5. Remove aft short shaft assembly (1).
6. DELETED
7. Clean, inspect, and repair aft short shaft assembly (1) (Task 6-6-5).

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INSTALL

**Warning**

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of the shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during installation or handling. Extreme caution shall be used during installation and handling.

Installation of beveled washers with rounded edge against coupling disc packs and correct torquing of nuts are characteristics critical to flight safety. If beveled washers are installed incorrectly, damage to coupling disc packs will result.

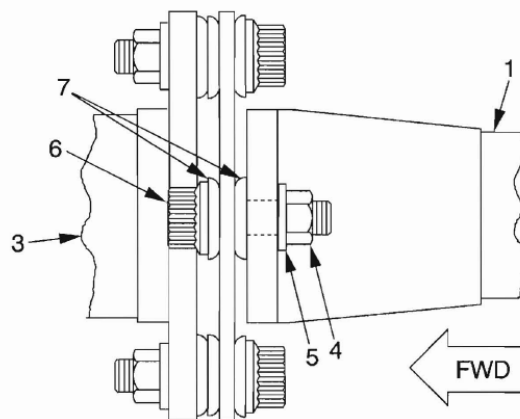
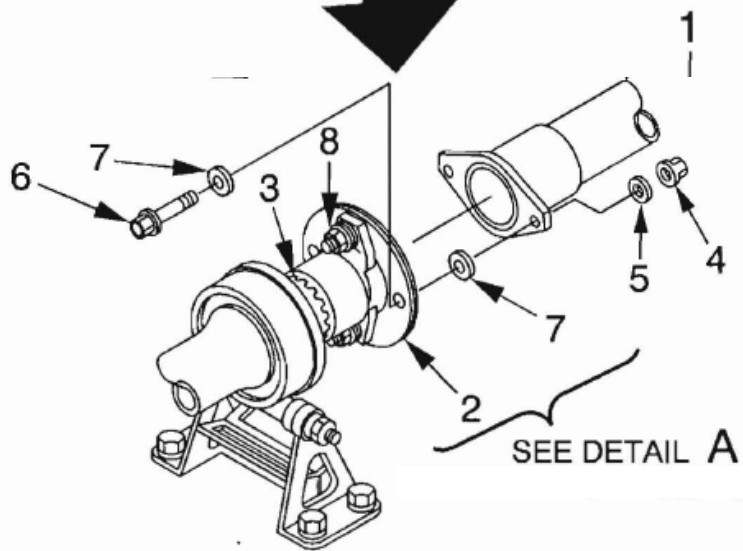
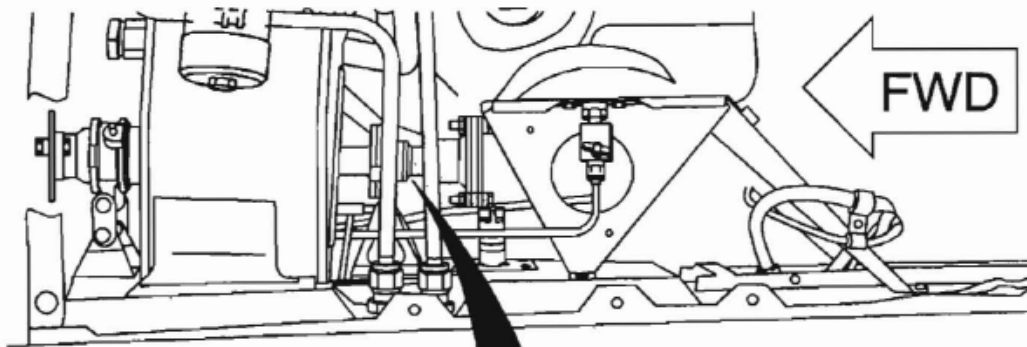
**Caution**

Only those self-locking nuts that cannot be tightened down with fingers after the locking action engages bolt shall be reused. Nuts shall be tested by attempting to insert a matching bolt by hand. Torque shall be applied only to nut with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc packs.

Aft short shaft assembly shall be supported to prevent damage to coupling disc packs.

8. Connect forward end of shaft assembly (1) to coupling disc pack (2) on adapter (3) by installing two bolts (6), four beveled washers (7), two flat washers (5), and two nuts (4).

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DETAIL A  
(CORRECT HARDWARE CONFIGURATION)

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**Warning**

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during installation or handling. Extreme caution shall be used during installation and handling.

Installation of beveled washers with rounded edge against coupling disc packs and correct torquing of nuts are characteristics critical to flight safety. If beveled washers are installed incorrectly, damage to coupling disc packs will result.

9. Connect aft end of shaft assembly (1) to coupling disc pack (9) on driveshaft assembly (10) by installing two bolts (13), four beveled washers (14) (with rounded edges in contact with coupling disc pack), two washers (12), and two nuts (11).

10. Torque nuts (4, 8, 11, and 15) and inspect for gaps between discs in both packs (Task 6-6-6).

**Note**

Task 6-6-19 shall be performed only if there has been repetitive spreading or damage that required coupling disc pack change.

11. Align tail rotor driveshaft (Task 6-6-19).

**INSPECT**

**FOLLOW-ON MAINTENANCE**

Install aft fairing assembly (Task 2-2-55)

Install aft fairing extension (Task 2-2-56)

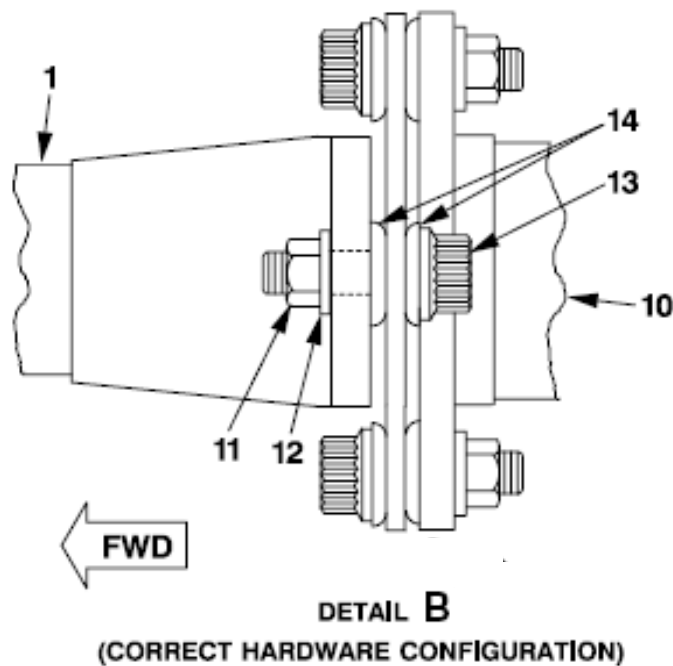
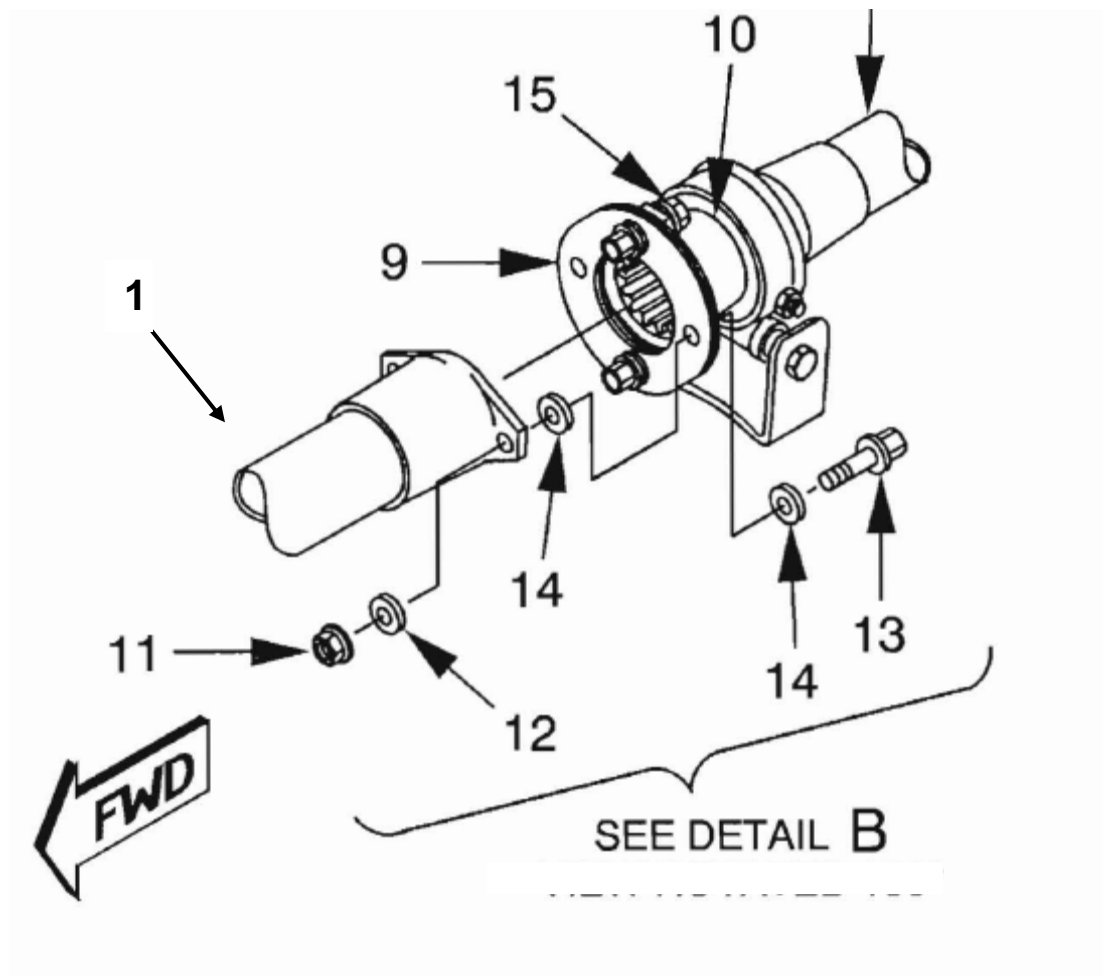
Install AN/ALQ-144 IR jammer mount (Task 2-2-13).

Close tail rotor driveshaft cover.

Pilot perform MOC (TM 1-1520-248-10/TM 1-1520-248-CL).

**END OF TASK**

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**6-6-6. Coupling Disc Pack -Removal/Cleaning/Installation**

Removal, Cleaning, and Installation (On Helicopter)

**INITIAL SETUP**

**Applicable Configurations:**

All

**Tools:**

General Mechanic Tool Kit (B-190)

Maintenance Stand (B-173)

Torque Wrench (B-246)

Torque Wrench (B-254)

Torque Wrench Adapter (B-5)

**Material:**

Denatured Alcohol O-E-760 (D-41)

Drycleaning Solvent, MIL-PRF-680 (D-80)

Corrosion Preventive Compound CPC, MIL-C-81309, Type II (D-102)

Corrosion Preventive Compound CPC, MIL-PRF-16173, Grade 1 (D-104)

Wiping Rags (D-195)

Rubber Gloves (D-133)

**Personnel Required:**

15S Scout Helicopter Technical Inspector (TI)

15S Scout Helicopter Repairer Pilot

**References:**

TM 1-1520-248-10

TM 1-1520-248-CL

**Equipment Condition:**

Helicopter Safed (Task 1-6-7)

Tail Rotor Driveshaft Cover Opened as needed

AN/ALQ-144 IR Jammer Mount Removed as needed (Task 2-3-13)

Aft Fairing Assembly Removed as needed (Task 2-2-55)

Aft Fairing Extension Removed as needed (Task 2-2-56)



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REMOVE

**Warning**

**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

Surface condition of the driveshaft assemblies is a characteristic critical to flight safety. Surface of driveshafts shall be smooth and unmarred. Surface shall not be damaged during removal, handling, or installation. Extreme caution shall be used during removal, handling, or installation.

**Caution**

- Driveshaft assemblies shall be supported to prevent damage to driveshafts, tailboom, or coupling disc packs.

**Note**

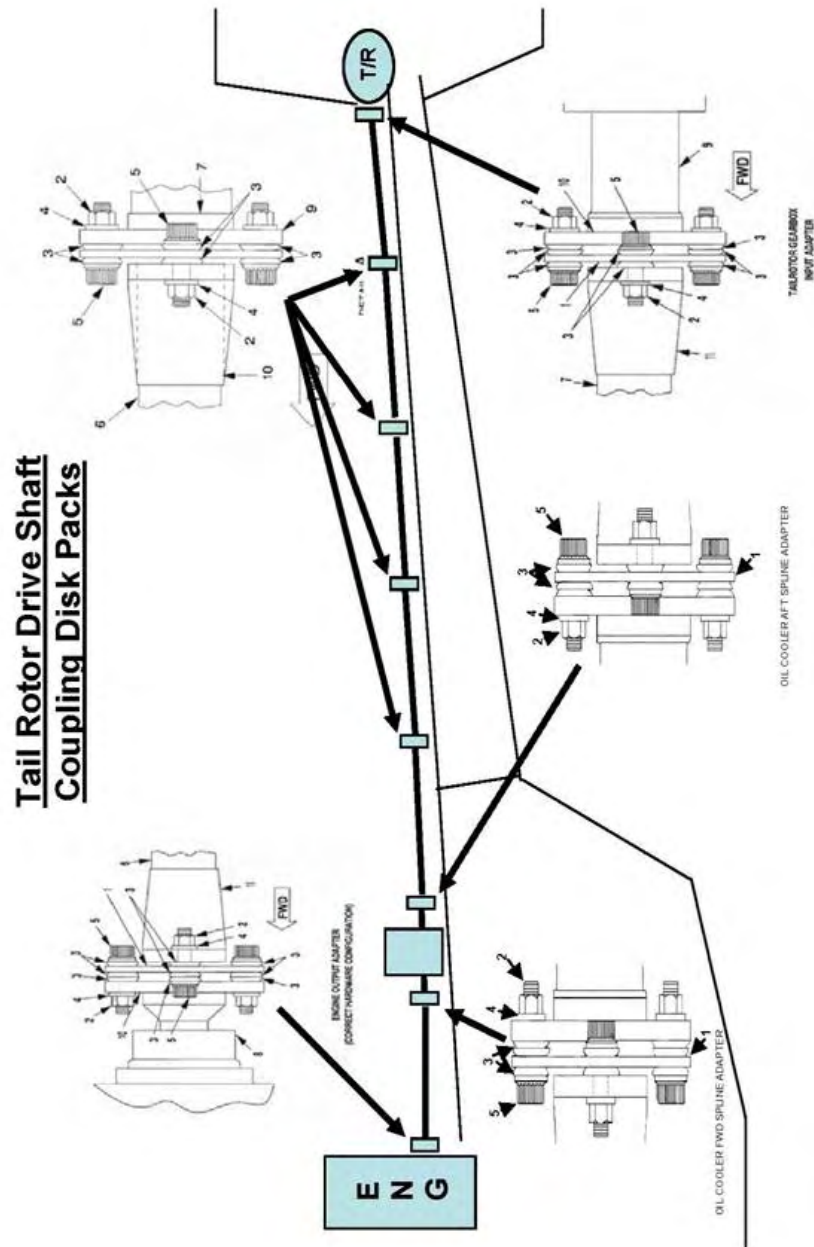
- For locations of coupling disc packs, see Figure Driveshaft and Coupling Locations.
- Coupling disc pack on engine output adapter has 12 beveled washers installed.
- Coupling disc packs on tail rotor gearbox input adapter and either side of the oil cooler have 10 beveled washers installed.
- All other coupling disc packs have eight beveled washers installed.

1. Remove coupling disc pack (1) by removing 4 nuts (2); 8, 10, or 12 beveled washers (3); 4 flat washers (4); and 4 bolts (5) connecting coupling disc pack (1) to driveshaft assemblies (6 and 7), driveshaft assembly (6) and engine output adapter (8), driveshaft assembly (7), and tail rotor gearbox input adapter (9), or driveshaft assembly (6) and oil cooler splined adapter (10).

**CLEAN**

2. Clean discs with drycleaning solvent (D-80) and wiping rags (D-195). Follow-up with a denatured alcohol (D-41) wipe using a clean rag.

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## INSTALL

### Warning

#### **FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

Installation of beveled washers with rounded edges against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If beveled washers are installed incorrectly, damage to coupling disc packs will result.

### Caution

- Driveshaft assemblies shall be supported to prevent damage to driveshafts, tailboom, and coupling disc packs.
- To prevent damage to helicopter, drive system is rotated by turning main rotor hub.
- If coupling disc pack is to be reused, disc stackup shall not be altered.
- Only those self-locking nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused.

3. Inspect coupling disc pack (Task 6-6-7).

### Note

- Refer to step 4. for washer stack up of all disc packs located between driveshaft assemblies (6 and 7).
- Refer to step 5. for washer stackup on engine output adapter.
- Refer to step 6. for washer stackup on tail rotor gearbox input adapter.
- Refer to step 6.1 for washer stackup on either side of oil cooler shaft.
- In the below applications that require the addition of a second stacked beveled washer to ensure adequate splined adapter engagement, the orientation of the beveled washer NOT in contact with the coupling disk pack is not a critical characteristic. The illustrations used within this task may be used for acceptable orientation.

4. Install coupling disc pack (1) between driveshaft assemblies (6 and 7, typical) and connect with four bolts (5), eight beveled washers (3) (with rounded edges in contact with coupling disc pack (1)), four flat washers (4), and four nuts (2) (with nuts on flange side). Ensure attaching hardware at 9, 12, and 3 o'clock positions is seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.

5. Install coupling disc pack (1) between driveshaft assembly (6) and engine output adapter (8) and connect with 4 bolts (5), 12 beveled washers (3) (with rounded edges in contact of coupling disc pack (1)), 4 flat washers (4), and 4 nuts (2). Ensure attaching

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hardware at 9, 12, and 3 o'clock positions is seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.

6. Install coupling disc pack (1) between driveshaft assembly (7) and tail rotor input adapter (9) and connect with 4 bolts (5), 10 washers (3) (with rounded edges in contact with coupling disc pack (1 )), 4 flat washers (4), and 4 nuts (2). Ensure attaching hardware at 9, 12, and 3 o'clock positions are seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.

6.1. Install coupling disc pack (1) between driveshaft assemblies (6) and oil cooler splined adapters (10) on each side of the oil cooler shaft and connect with 4 bolts (5), 10 washers (3) (with rounded edges in contact with coupling disc pack (1 )), 4 flat washers (4), and 4 nuts (2). Ensure attaching hardware at 9, 12, and 3 o'clock positions are seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.

**Caution**

- To prevent damage to helicopter, adequate clearance shall exist around helicopter to allow full rotation of main and tail rotors before attempting following torquing procedures.
- To prevent gaps in coupling disc packs, torque shall be applied to nut with bolt held stationary.
- Torquing of four nuts (2) shall be alternated by no more than 20 inch-pound increments until correct torque value is reached.
- If use of torque wrench adapter (B-5) is required, calculation of corrected torque (Appendix P) may be necessary.

7. Looking forward, torque 9 o'clock position nut (2) to **20 inch-pounds**.

**Caution**

- To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

8. Looking forward, rotate driveshaft assemblies (6 and 7) 180 degrees clockwise.

9. Looking forward and using socket or torque wrench adapter (B-5), torque 9 o'clock position nut (2) to **20 inch-pounds**.

**Caution**

- To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

10. Looking forward, rotate driveshaft assemblies (6 and 7) 90 degrees clockwise.

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11. Repeat step 7.

**Caution**

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

12. Looking forward, rotate driveshaft assemblies (6 and 7) 180 degrees clockwise.

13 Repeat step 7.

**Caution**

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

14. Looking forward, rotate driveshaft assemblies (6 and 7) 270 degrees clockwise.

15. Increase torque by **20 inch-pounds** and repeat steps 5. through 12.

16. Repeat step 13. by increasing torque by no more than **20 inch-pounds** until nuts (2) have been torqued **150 to 180 inch-pounds**.

17. Inspect for gaps between individual laminations in installed coupling disc pack (1) and adjacent coupling disc packs (1). Gaps in excess of 0.015 inch are unacceptable.

18. Correct unacceptable gaps as follows:

a. Perform these steps first:

(1) Loosen nuts (2) of affected coupling disc packs (1) only enough to permit disc pack realignment.

**Caution**

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

(2) Looking forward, rotate driveshaft assemblies several revolutions clockwise.

(3) Repeat steps 5. through 17.

b. If gaps are still unacceptable, perform the following:

(1) Remove disc pack (step 1).

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(2) Disassemble disc pack and rotate affected disc 180 degrees ensuring index flats on each disc are positioned 90 degrees from the disc segment before and after in the disc pack.

(3) Repeat steps 5 through 17.

**Note**

- Task 6-6-19 is only required to be completed if there has been repetitive spreading of disc pack, or following the major maintenance tasks defined in Task 6-6-19.

19. Align tail rotor driveshaft (Task 6-6-19).

**APPLY CORROSION PREVENTIVE COMPOUND**

**Caution**

- Corrosion preventive compound shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may occur.

20. After assembly, apply a light coat of CPC (D-104) to exposed threads. Apply CPC (D-102) to external and internal edge of the disc pack. Follow application with shaft rotation to ensure an even wetting application.

**INSPECT**

**FOLLOW-ON MAINTENANCE**

Install AN/ALQ-144 IR Jammer mount (Task 2-2-13).

Install aft fairing assembly as needed (Task 2-2-55).

Install aft fairing extension as needed (Task 2-2-56).

Close tail rotor driveshaft cover.

Pilot perform MOC (TM 1-1520-248-10/TM 1-1520-248-CL).

**END OF TASK**

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Tail Rotor (TR) Driveshaft Alignment Check

**6-6-7. Coupling Disc Pack Assemblies - Inspection**

Inspection (On Helicopter/Off Helicopter)

**INITIAL SETUP**

**Applicable Configurations:**

All

**Tools:**

General Mechanic Tool Kit (B-190)

Maintenance Stand (B-173)

**Material:**

Denatured Alcohol, O-E-760 (D-41)

Drycleaning Solvent, MIL-PRF-680 (D-80)

Rubber Gloves (D-133)

**Personnel Required:**

15S Scout Helicopter Technical Inspector (TI)

15S Scout Helicopter Repairer

**References:**

TM 1-1520-266-23

**Equipment Condition:**

Helicopter Safed (Task 1-6-7)

Aft Fairing Assembly Removed as needed (Task 2-2-55)

Aft Fairing Extension Removed as needed (Task 2-2-56)

AN/ALQ-144 IR Jammer Mount Removed as needed (Task 2-3-13)

Tail Rotor Driveshaft Cover Opened as needed

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INSPECT

1. Inspect coupling disc packs (1) for scratches, nicks, and cracks. See Figure Coupling Disc Pack Assemblies Locator. If a crack in coupling disc pack is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.
2. Damage limits: Maximum removal not to exceed **0.001 inch**. Cracks or nicks are not allowed.
3. Inspect coupling disc packs (1) for corrosion. If corrosion is present, remove corrosion from disc pack using a pink eraser
4. Inspect for gaps between discs within each coupling disc pack (1). Gaps in excess of **0.015 inch** are unacceptable.
5. Inspect coupling disc pack (1) for dirt buildup between discs.
6. Clean (Task 6-6-6) and reuse excessively dirty disc packs unless damaged beyond limits.

**Warning**

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)  
Correct torquing of nuts (2) is a characteristic critical to flight safety.

**Caution**

Torque shall be applied only to nut with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

7. If required, correct unacceptable gaps and properly torque nuts (2) (Task 6-6-6).
8. Replace defective coupling disc packs (1) (Task 6-6-6).

INSPECT

FOLLOW-ON MAINTENANCE

Install aft fairing assembly (Task 2-2-55)

Install aft fairing extension assembly (Task 2-2-56).

Install AN/ALQ-144 IR jammer mount (Task 2-3-13).

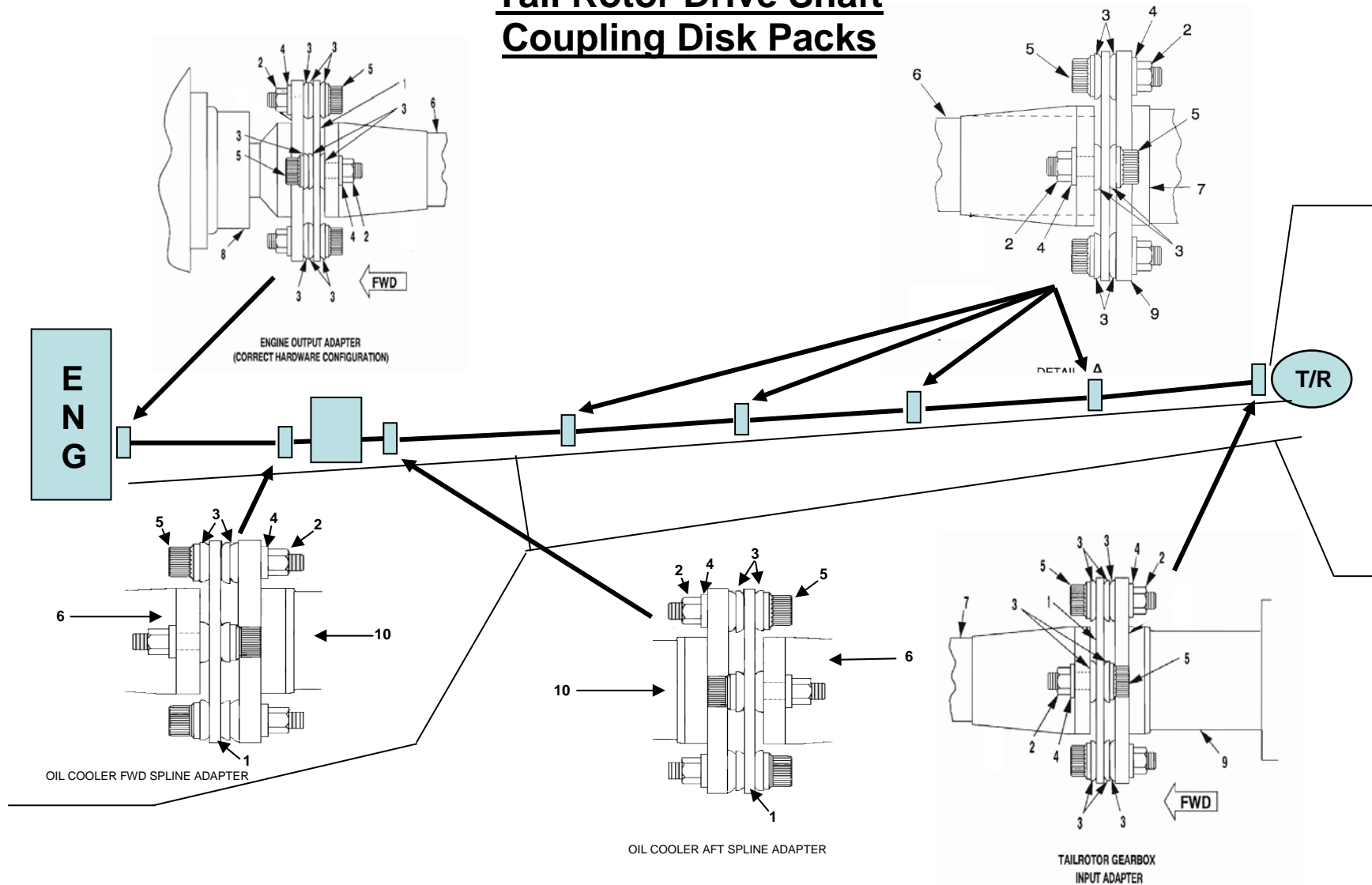
Close tail rotor driveshaft cover.

END OF TASK

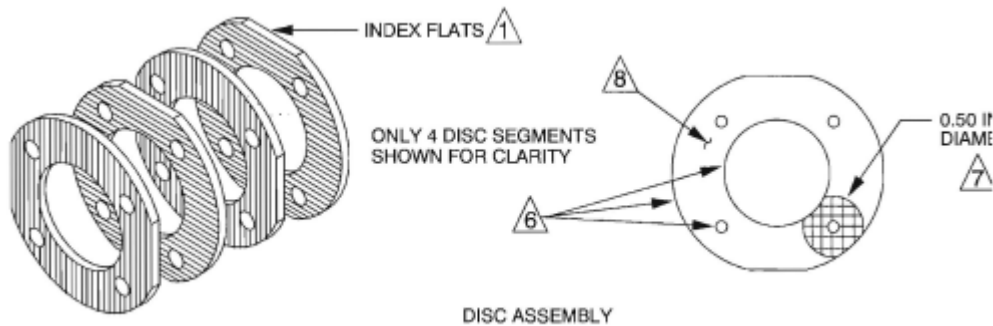


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## Tail Rotor Drive Shaft Coupling Disk Packs



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**CAUTION**

MAKE SURE THAT THE ORDER IN WHICH THE DISC SEGMENTS ARE STACKED DOES NOT CHANGE AFTER THE COUPLING DISC PACK HAS OPERATED.

NOTES

1. The grain of the disc segment is parallel to the index flats. Make sure that the index flats on each disc segment are turned 90 degrees from the disc segment before and the disc segment after the disc pack.
2. A coupling disc pack is 0.115 to 0.127 inch thick. A coupling disc pack has a maximum of 12 disc segments. Each disc segment is 0.010 to 0.014 inch thick.
3. Use solvent (MIL-PRF-680) to clean grease and oil from each disc segment. Follow-up with a denatured alcohol (O-E-760) wipe using a clean rag.
4. Use a soft rubber eraser to clean fretting corrosion.
5. Cracks, nicks, and scratches are not permitted.
- 6 No fretting damage is permitted in less than 0.050 inch from an edge.
7. Discard disc segments that have fretting corrosion of more than 0.001 inch deep and on more than 40 percent of the area (4 places each side). Damage of 0.001 inch can be felt with a 0.010 inch spherical radius probe.
8. Random light fretting corrosion is permitted if corrosion is not on more than 5 percent of each quadrant, and each pitted area is not more than 0.005 inch in diameter and 0.001 inch in depth. Damage of 0.001 inch can be felt with a 0.010 inch spherical radius probe.
9. DELETED

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**6-6-19. Tail Rotor Driveshaft Coupling Angle -Inspection and Driveshaft Alignment**

Inspection of Tail Rotor Driveshaft Disc Pack Operating Angles and Reshimming of Tail Rotor Driveshafts to Bring Disc Pack Operating angles Within Limits (On Helicopter)

**INITIAL SETUP Applicable Configurations:**

All

**Tools:**

Alignment Tool Set (B-198)  
Gunner's Quadrant (1290-00-891-9999) or Digital Protractor (5210-01-418-0671)  
Dial Indicator (B-44)  
Dial Test Indicator Sleeve (B-159)  
General Mechanic Tool Kit (B-190)  
Hydraulic Jacks (B-85)  
Maintenance Stand (B-173)  
Torque Wrench (B-245)  
Torque Wrench (B-254)

**Personnel Required:**

15S Scout Helicopter Technical Inspector (TI)  
15S Scout Helicopter Repairer  
Pilot

**References:**

TM 1-1520-248-10  
TM 1-1520-248-CL

**Equipment Condition:**

Helicopter Safed (Task 1-6-7)  
AN/ALQ-144 IR Jammer Mount Removed (Task 2-3-13)  
Aft Fairing Assembly Removed (Task 2-2-56)  
Aft Fairing Extension Removed (Task 2-2-56)  
Jacking Helicopter (Task 1-6-8)

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**INSPECT COUPLING ANGLES**

1. Place maintenance stand (B-173) on right side of helicopter.

**---Warning---**

- No attempt shall be made to unlatch aft cover while tail rotor is in operation; injury or death to personnel could result

2. Open or remove (as applicable) aft tail rotor driveshaft cover (1).

3. Open forward tail rotor driveshaft cover (2).

**---Note---**

- This procedure will be required in full anytime the oil cooler deck, tailboom, or tailboom attachment bulkhead are replaced, or anytime there is reason to believe the tail rotor drive train is out of alignment (i.e. repetitive disc pack spreading, cracked hanger supports, etc..).
- If this inspection is being accomplished due to the reshimming of engine mounts to align the engine to the transmission, only the angles at the forward and aft end of the fan shaft requires inspection. If an adjustment is required the entire procedure will be followed to inspect the angles of the remaining shafts.

4. Inspect coupling angles as follows:

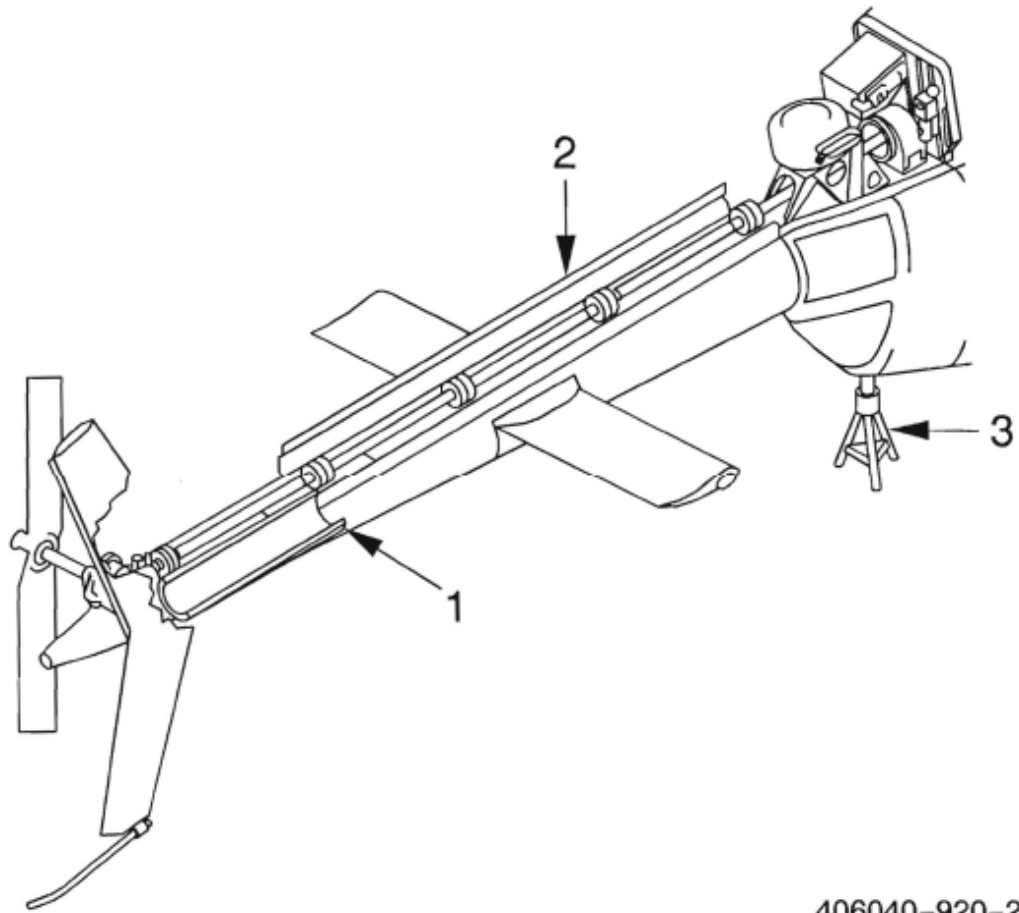
**---Warning---**

- Helicopter shall be placed in relatively wind-free area prior to jacking. Sustained wind or sudden wind gusts may topple helicopter from jacks. Injury or death to personnel could result
- Helicopter shall not be left unattended when using jacks without positive locks.

**---Caution---**

- The following precautions shall be observed while helicopter is on jacks or damage to helicopter could result:
- Helicopter shall not be climbed on or entered.
- Caution shall be used to avoid bumping or otherwise disturbing helicopter
- Area around helicopter shall be roped off and signs displayed: THIS HELICOPTER ON JACKS.

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J0430

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---Note---

- The purpose of the requirement to jack and level the aircraft is to establish a fixed baseline. In a level aircraft attitude all tail rotor driveshaft angles are positive to the horizontal plane.
- The engine to tailrotor gearbox driveline has a 10.5" rise, which conveys to 79.8 milliradian (mils) or 4.56° coupling angle. This angle is accommodated by incrementally sharing the angle over each of the eight coupling disc packs.

a. Jack (3) and level aircraft (Task 1-6-8). Shore aircraft with blocks to prevent movement.

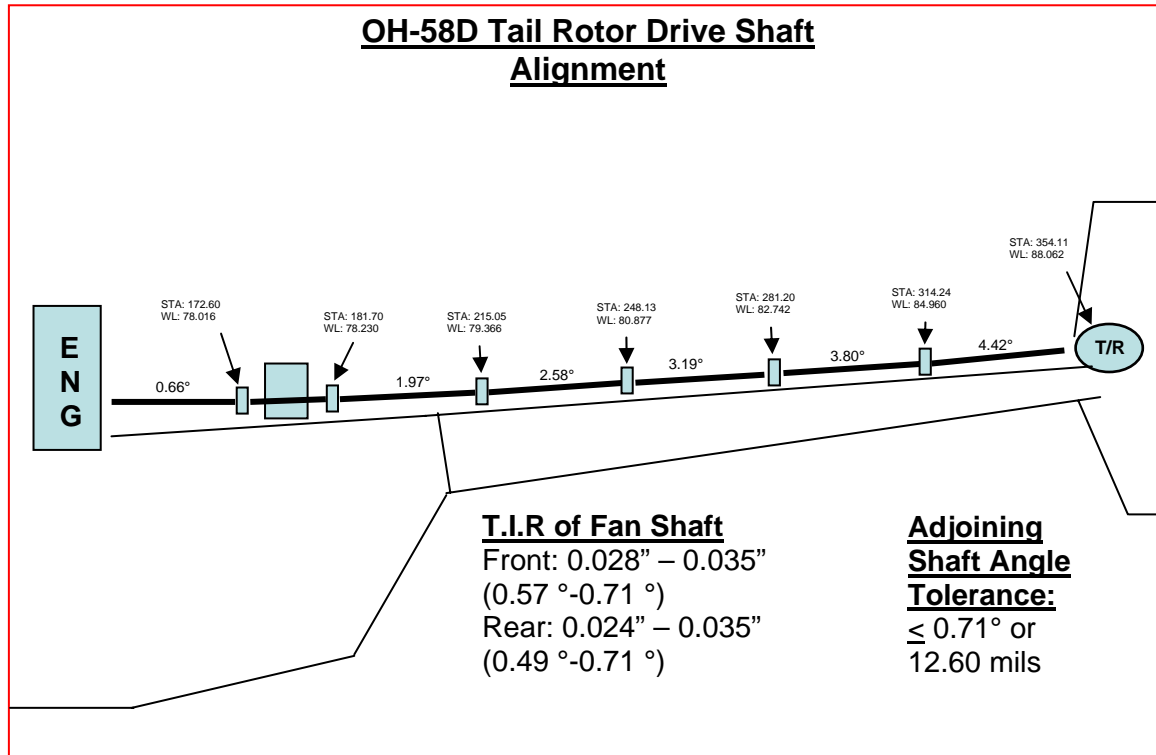
---Note---

- The use of a digital protractor (Inclinometer) is limited to NSN: 5210-01-418-0671, the Kelstrom Pro3600. This protractor is capable to displaying the accuracy required to complete the task (degrees to the second decimal).
- To convert milliradians (mils) to degrees multiply by 0.0573.
- Always subtract value "Y" (forward shaft) from value "X" (aft shaft) to obtain the angle between the adjacent driveshaft segments.

b. Use a gunner's quadrant or digital protractor to measure angle of horizontal plane of each driveshaft assembly (4). Start the measurements at the most aft and work towards the front of the helicopter. Obtain measurements for all shafts other than the oil cooler fan. This shaft will be addressed later in this procedure.

c. The difference in angles between two adjacent driveshaft assemblies shall not exceed **12.60 milliradians (mils) (0.71°)**. Record angles measured in milliradians or hundredths of degrees. If difference in reading between two adjacent driveshaft assemblies (4) exceeds limits, bearing hanger support shims (6) shall be removed or added to acquire correct angle.

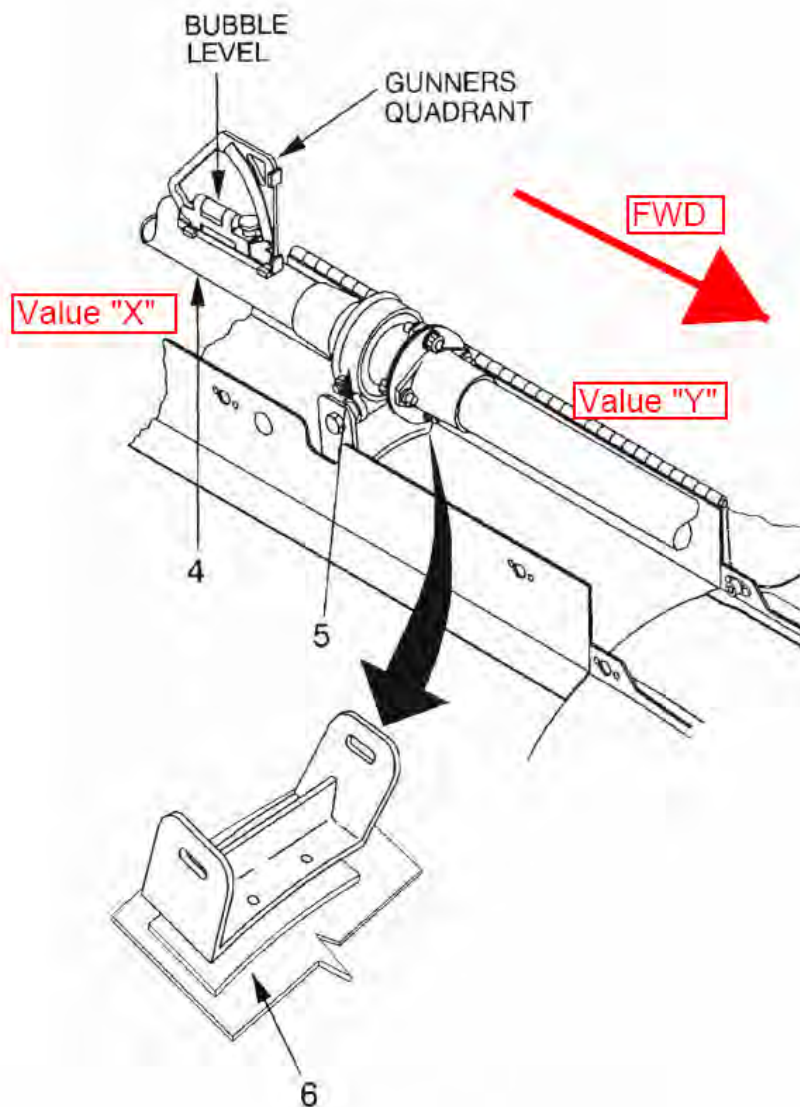
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---Note---

- The angles listed above each shaft in the above figure are for reference only. These angles represent an optimum spread, and do not account for variations within each aircraft.
- Alignment and numbering of the shafts progress forward from the tail rotor gearbox. This numbering also holds true to the hanger bearings, brackets, couplers, etc...

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**ALIGN DRIVESHAFT**

5. To gain proper difference in angles between two adjacent driveshaft assemblies (4), proceed as follows:

**---Note---**

- A typical procedure is described. Procedures for driveshaft assemblies other than fan shaft are similar.
- The adjustment of any one coupling angle will have an effect on the coupling angles both forward and aft of that location. Ensure that coupling angles are re-verified following adjustments.
- Removing shims will increase angle and adding shims will decrease angle.

- a. Remove driveshaft assemblies (4) and bearing hanger (5) (Task 6-6-8)
- b. Remove support (7) from shim (6) (Task 2-3-10).
- c. Remove or add shims (6) as needed to correct difference in readings between two adjacent driveshaft assemblies (4).
- d. Install support (7) (Task 2-3-10)
- e. Install bearing hanger (5) and driveshafts (4) (Task 6-6-8).
- f. Recheck difference in angle between two adjacent driveshaft assemblies (4). If limit is exceeded, repeat steps 5.a. through 5.e.

**INSPECT/ALIGN FAN SHAFT**

6. Use dial indicator (B-44), alignment tool set (B-198) and dial test indicator sleeve (B-159) to inspect coupling angles on fan shaft (8) as follows:

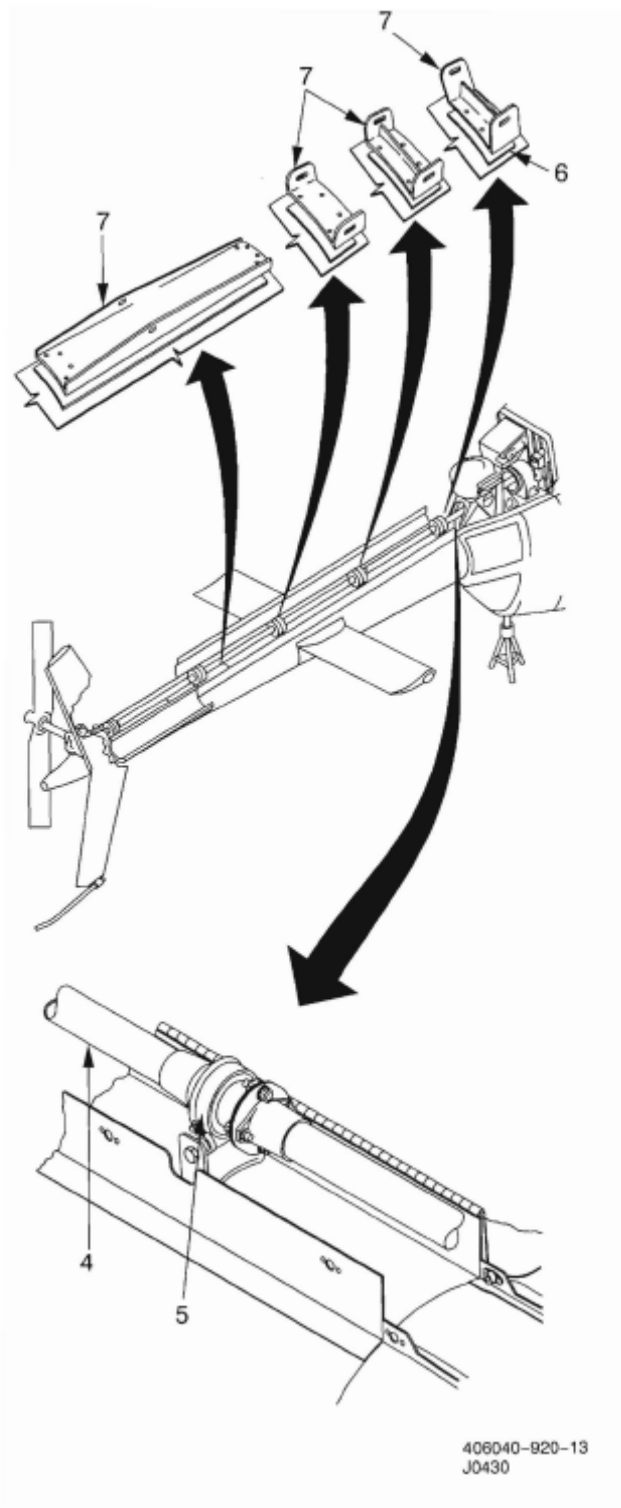
- a. Remove one bolt (9), one nut (10), and associated washers (11 and 12) from disc pack (13) and adapter coupling (14) located at aft end of fan shaft (8). Save hardware for installation.

**---Warning---**

**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

- Installation of beveled washers with rounded side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc pack will result.

ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check



ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check

**---Caution---**

- Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

**---Note---**

- Short end of bolt (part of (B-198)) (15) shall be facing forward.
- b. Install bolt (part of (B-198)) (15) with two beveled washers (11) (One under the head of the bolt and one between the disc pack, and adapter. Ensure rounded edges are in contact with coupling disc pack.), and washer (12) through bolt hole in disc pack (13) and adapter coupling (14). Secure bolt (15) with nut (10).
- c. Torque nut (10) **150 INCH-POUNDS**.
- d. Thread post (part of (B-198)) (16) onto bolt (part of (B-198)) (15) and place dial test indicator sleeve (part of (B-159)) (17) or post (16).
- e. Install ball tip (part of (B-44)) (18) on dial indicator (part of (B-44)) (19) Install dial indicator (B-44) (19) on dial test indicator sleeve (part of (B-159)) (17)
- f. Position dial indicator (part of (B-44)) (19) with stem at 90° to centerline of fan shaft (8). Dial indicator ball tip (part of (B-44)) (18) shall contact splined adapter (20) 0.100 inch from edge
- g. Set travel (preload) of dial indicator (B-44) (19) so it can sweep **± 0.04 inch** without bottoming.

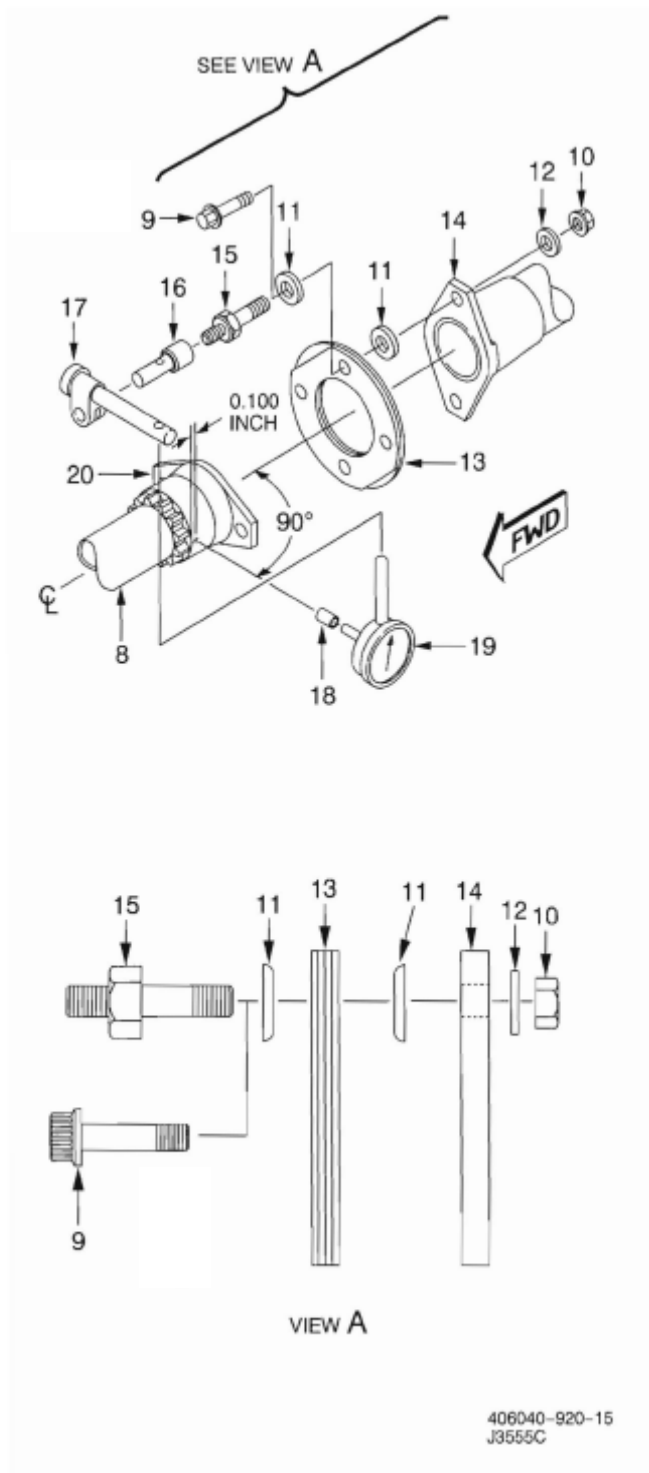
**---Caution---**

- Main rotor blades and tail rotor blades shall be clear before rotating fan shaft. Damage to blades may occur if they strike an object.
- To prevent damage to tail rotor driveshaft or dial indicator, clearance shall be observed while main rotor hub is rotated very slowly.
- To prevent damage to helicopter, drive system shall be rotated by turning main rotor hub.

**---Note---**

- Care shall be exercised in reading dial indicator. Stem shall always be more depressed (clockwise needle motion) at top of total indicator reading (T.I.R.) sweep than at bottom. This will avoid reversing curvature of driveshaft. With angles as small as 0.6°, the eye cannot readily detect whether angle is up or down.
- A maximum sweep indication at other than the 12 o'clock position is indicative of a lateral misalignment. Limited play between the hanger bracket hardware and the deck inserts allow for minor lateral corrections.

ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check



ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check

h. Using an inspection mirror to read dial indicator (B-44) (19), slowly rotate fan shaft (8) until indicator stem is contacting lower side of shaft and the indicator needle stops and reverses direction. By rotating the indicator face, zero the indicator at the reversal point. Continue to slowly rotate fan shaft (8) until indicator stem is contacting the upper side of the shaft and the indicator needle again stops and reverses direction. Record reading. If reading is not within limits, take no remedial action until coupling at opposite end of fan shaft (8) is checked.

- Maximum allowable indicator reading **0.035 inch** (0.71°).
- Minimum recommended indicator reading **0.024 inch** (0.49°).

**---Warning---**

**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

- Installation of beveled washers with rounded side against disc pack is a characteristic critical to flight safety.

**---Warning---**

- Only those self-locking nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused. Test nuts by attempting to insert matching bolt by hand.

**---Caution---**

- Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

i. Remove nut (10), washer (12), dial indicator set (B-44) (18 and 19), dial test indicator sleeve (B-159) (17), post (part of (B-198)) (16), bolt (part of (B-198)) (15) from aft disc pack (13), and adapter coupling (14). Install bolt (9), two beveled washers (11) (with rounded edges in contact with coupling disc pack), washer (12), and nut (10).

j. Break torque on remaining three nuts (10) for aft fan shaft coupling.

k. Torque nuts (10) following required sequence and inspect for gaps in coupling disc packs (Task 6-6-6).

l. Remove one bolt (9), one nut (10), and associated washers (11 and 12) from disc pack (13) and splined adapter (20) at forward end of fan shaft. Save hardware for installation.

**---Warning---**

**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

- Installation of beveled washers with rounded side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If beveled washers are installed incorrectly, damage to coupling disc pack will result.

ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check

---Caution---

- Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

---Note---

- Short end of bolt (part of (B-198)) (15) shall be facing forward.

m. Install bolt (part of (B-198)) (15) with three beveled washers (11) (One under the head of the bolt and two between the disc pack and adapter. Ensure rounded edges are in contact with coupling disc pack.), and washer (12) through bolt hole in coupling disc pack (13) and splined adapter (20). Secure bolt (part of (B-198)) with nut (10).

n. Torque nut (10) **150 INCH-POUNDS**.

o. Thread post (part of (B-198)) (16) onto bolt (part of (B-198)) (15) and place dial test indicator sleeve (B-159) (17) on post (16)

p. Install ball tip (part of (B-44)) (18) on dial indicator (B-44) (19). Install dial indicator (19) on dial test indicator sleeve (B-159) (17).

q. Position dial indicator (B-44) (19) with stem at 90° to centerline of fan shaft (8). Dial indicator (B-44) (19) shall contact forward driveshaft coupling adapter (14) **0.76 inches** from edge. Point of contact is on tapered portion of coupling adapter (14).

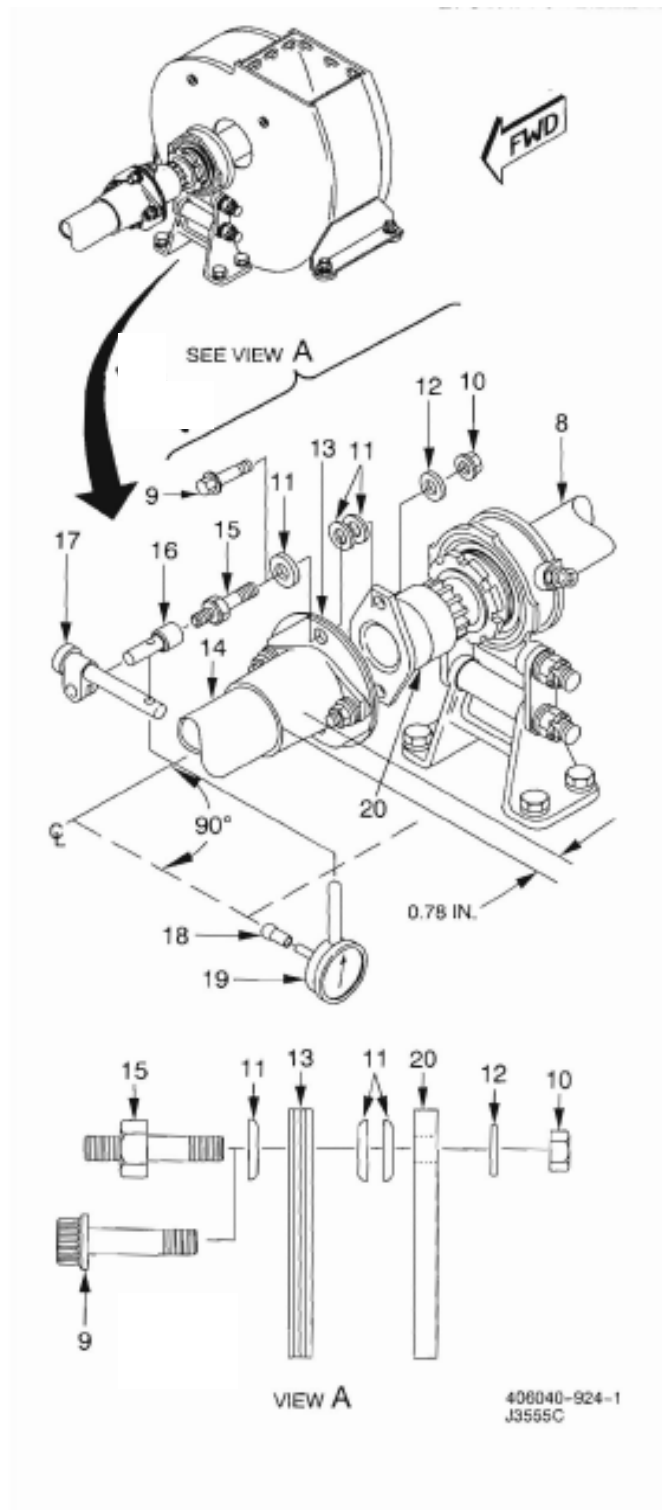
---Caution---

- Main rotor blades and tail rotor blades shall be clear before rotating fan shaft. Damage to blades may occur if they strike an object.
- To prevent damage to tail rotor driveshaft or dial indicator, clearance shall be observed while main rotor hub is rotated very slowly.
- To prevent damage to helicopter, drive system shall be rotated by turning main rotor hub.

---Note---

- Care shall be exercised in reading dial indicator. Stem shall always be more depressed (clockwise needle motion) at top of total indicator reading (T.I.R.) sweep than at bottom. This will avoid reversing curvature of driveshaft. With angles as small as 0.6°, the eye cannot readily detect whether angle is up or down.
- A maximum sweep indication at other than the 12 o'clock position is indicative of a lateral misalignment. Limited play between the hanger bracket hardware and the deck inserts allow for minor lateral corrections.

ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check



ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check

r. Using an inspection mirror to read dial indicator (B-44) (19), slowly rotate fan shaft (8) until indicator stem is contacting lower side of shaft and the indicator needle stops and reverses direction. By rotating the indicator face, zero the indicator at the reversal point. Continue to slowly rotate fan shaft (8) until indicator stem is contacting the upper side of the shaft and the indicator needle again stops and reverses direction. Record reading.

- Maximum allowable indicator reading **0.035 inch** (0.71°)
- Minimum recommended indicator reading **0.028 inch** (0.57").

s. If both adapter couplings are within limits, remove nut (10), washer (12), dial indicator set (B-44) (18 and 19), dial test indicator sleeve (B-159) (17), post (part of (B-198)) (16), bolt (part of (B-198)) (15) from forward coupling disc pack (13), adapter coupling (14), and splined adapter (20). Install bolt (9), three beveled washers (11) (with rounded edges in contact with coupling disc pack), washer (12), and nut (10).

**---Warning---**

**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

- Installation of beveled washers with rounded side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc pack will result.

**---Warning---**

- Only those self-locking nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused. Test nuts by attempting to insert matching bolt by hand.

**---Caution---**

- Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

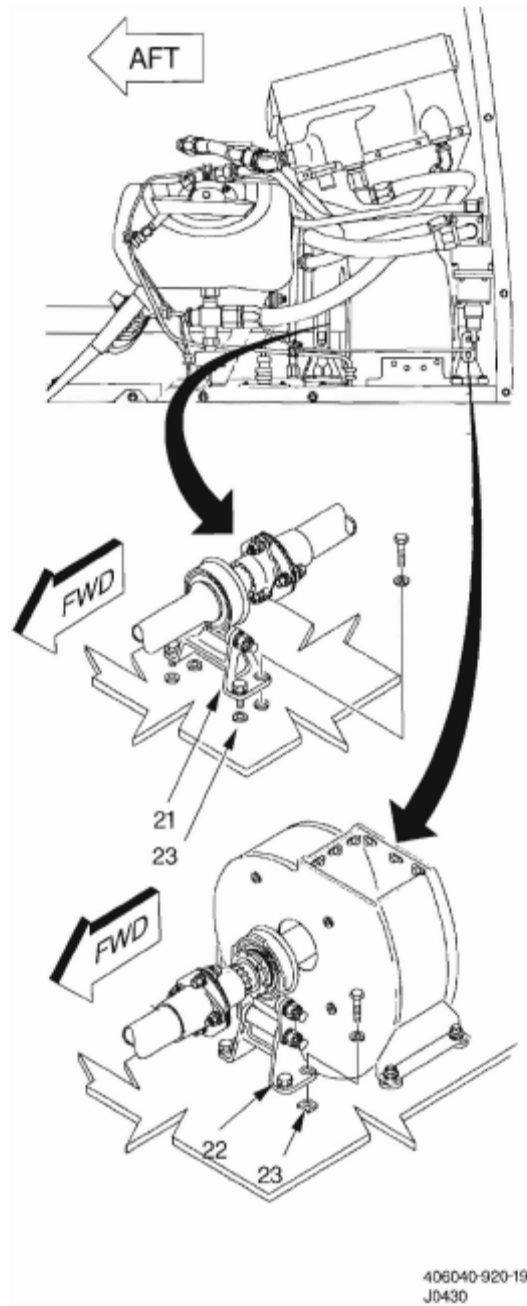
t. Break torque on remaining three nuts (10) of forward fan shaft coupling.

u. Torque nuts (10) following required sequence and inspect for gaps in coupling disc packs (Task 6-6-7).

v. If the disc pack coupling angle at either end of the fan shaft is less than the recommended minimum, the angle between the third driveshaft and first segmented driveshaft may exceed the maximum allowable limits. Inspection of the angle between these shafts is required. If the angle is high, do not take action to align the shafts until steps are taken to optimize the fan shaft disc pack coupling. Remove shim from hanger mount and add shim to opposite hanger mount.



ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check



ADDENDUM TO H-58-09-AMAM-03  
Tail Rotor (TR) Driveshaft Alignment Check

**---Caution---**

- After shimming procedure is completed, fan impeller shall not rub on impeller housing. Reshimming of housing may be necessary.

**---Note---**

- Shims may have to be adjusted under both hanger mounts to maintain limits on both ends of shaft.

- (1) Remove hanger bracket (21) and/or hanger bracket (22) (Task 6-6-16).
- (2) Remove or add thickness of shims (23).
- (3) Install hanger bracket (21) and/or hanger bracket (22) (Task 6-6-16).
- (4) Repeat procedure for inspection of coupling angles (steps 6.a. through 6.r.).
- (5) If adapter couplings are within limits, remove dial indicator (B-44), dial test indicator sleeve (B-159), and alignment tool set (B-198) (step 6.s.).
- (6) If adapter couplings are not within limits, adjust shim thickness (step 6.v.).
- (7) Continue repeating procedure for inspection of coupling angles until both adapter couplings are within limits.

**INSPECT**

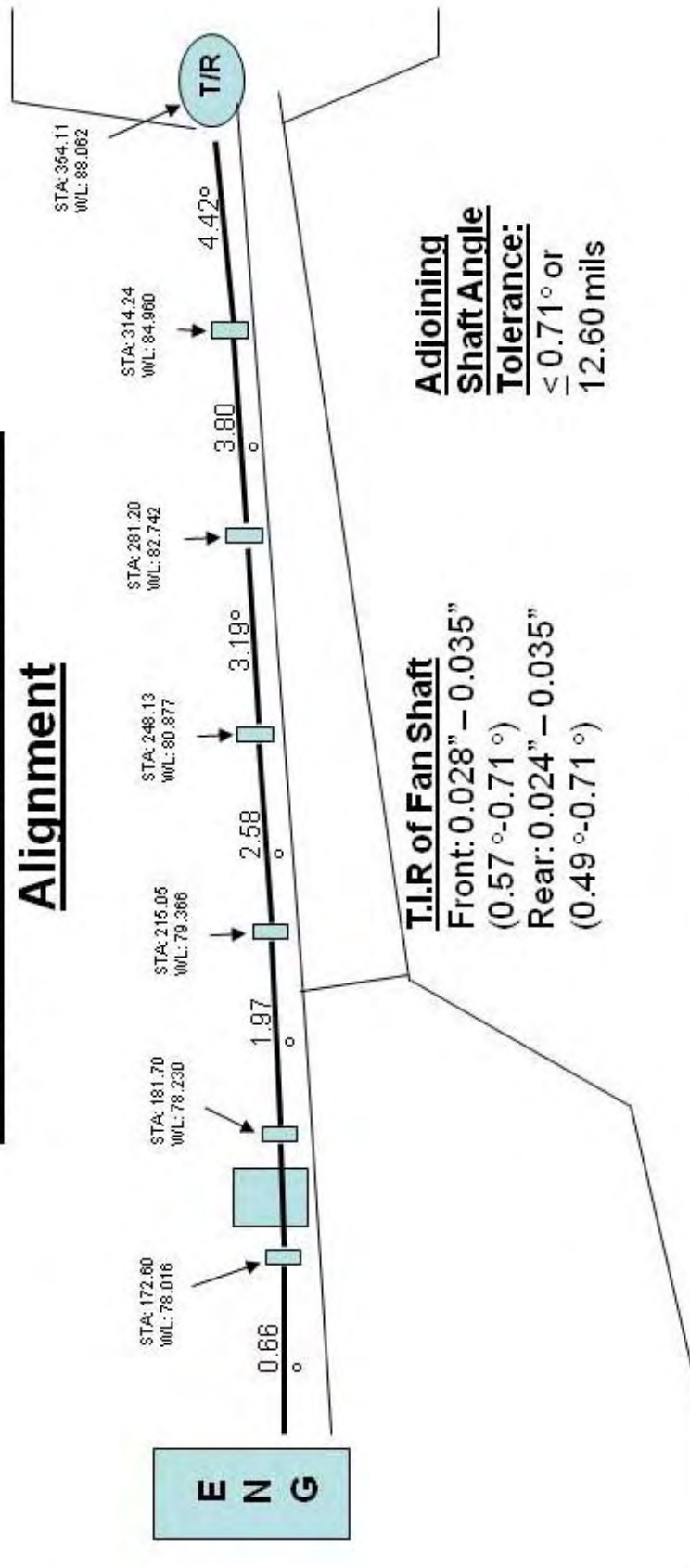
7. Lower helicopter and remove jacks (3) (Task 1-6-8).
8. Close tail rotor driveshaft cover (2).
9. Close or install (as applicable) tail rotor driveshaft cover (1).

**FOLLOW-ON MAINTENANCE**

Install aft fairing assembly (Task 2-2-55).  
Install aft fairing extension (Task 2-2-56).  
Install AN/ALQ-144 IR jammer mount (Task 2-3-13).  
Pilot perform MOC (TM 1-1520-248-10/TM 1-1520-248-CL).

**END OF TASK**

## OH-58D Tail Rotor Drive Shaft Alignment



### **Note**

- The angles listed above each shaft in the above figure are for demonstration only. These angles represent an optimum spread, and do not account for variations within each aircraft.
- Alignment and numbering of the shafts progress forward from the tail rotor gearbox. This numbering also holds true to the hanger bearings, brackets, couplers, etc....